CIVIL QUALITY CONSULTANTS & ENGINEERS

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Job No.: CQCE/BBMP/KDC/W.No.17/2017-18 Date: 04.10.2017

Aggregate Impact Value
IS: 2386 Part IV

Client	**Executive Engineer,** Rajarajeshwari Nagar Division, BBMP, Bangalore.
Agency	**Sri. K.Damodar & Co,** Contractor, Bangalore.
Name of the Work	Remodeling of Segregation Point, RCC Drain and Development of water body at JP Park (Muthyalanagara) in Ward No.17, BBMP, Bangalore.
Type of Mix	Wet Mix macadam
Date of Testing	04.10.2017

Sl No.	Details	Trial No. 1	Trial No. 2	Trial No. 3	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	376	378	380	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	87	89	91	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	289	289	289	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	23.14	23.54	23.95	23.54

Comments:

- Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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For CIVIL QUALITY CONSULTANTS & ENGINEERS

Authorised Signatory

Office & Laboratory : # 133, Bhuvaneshwarinagar, Dodda Basti Main Road, Bangalore - 560 056.
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Job No.: CQCE/BBMP/KDC/W.No.17/2017-18 04.10.2017

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Rajarajeshwari Nagar Division, BBMP, Bangalore.
Agency	**Sri. K.Damodar & Co,** Contractor, Bangalore.
Name of Work	Remodeling of Segregation Point, RCC Drain and Development of water body at JP Park (Muthyalanagara) in Ward No.17, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Sample ID	WMM Layer
Date of Testing	04.10.2017

Result : Flakiness Index = **12.58%**

Elongation Index = **13.25%**

Result : **Combined Flakiness & Elongation index** 25.83%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CQCE/BBMP/KDC/W.No.17/2017-18 Date : 04.10.2017

ATTERBERG LIMITS TEST FOR WMM
MORTH TABLE-400-11

Client : **Executive Engineer,** Rajarajeshwari Nagar Division, BBMP, Bangalore.

Agency : **Sri. K.Damodar & Co,** Contractor, Bangalore.

Name of Work : Remodeling of Segregation Point, RCC Drain and Development of water body at JP Park (Muthyalanagara) in Ward No.17, BBMP, Bangalore.

Date of Testing : 04.10.2017

Material Type : Wet Mix Macadam

As per MORTH Table 400-13

Sl. No.	Particulars	Test Results	Standards as per Specifications
1	Liquid Limit	22.50	-
2	Plasticity Index, %	Non Plastic	6.0% Maximum.

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Job No.: CQCE/BBMP/KDC/W.No.17/2017-18 Date: 09.10.2017

TEST REPORT

Client	:	**Executive Engineer,** Rajarajeshwari Nagar Division, BBMP, Bangalore.
Agency	:	**Sri. K.Damodar & Co,** Contractor, Bangalore.
Name of the work	:	Remodeling of Segregation Point, RCC Drain and Development of water body at JP Park (Muthyalanagara) in Ward No.17, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Date of testing	:	09.10.2017

The results of the tests conducted on the bitumen sample using for Bituminous Macadam

Sl. No	Description	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 ^{0}C, 1/10 mm	63	60 to 70
2	Softening point, ^{0}C	49	Min. 45
3	Ductility at 27^{0}C, cm	100 >	Min. 50
4	Flash Point, ^{0}C	323	Min. 220

Note:

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Job No: CQCE/BBMP/KDC/W.No.17/2017-18 09.10.2017

Aggregate Gradation Test
IS : 2386 Part I

Client	**Executive Engineer,** Rajarajeshwari Nagar Division, BBMP, Bangalore.
Agency	**Sri. K.Damodar & Co,** Contractor, Bangalore.
Name of the work	Remodeling of Segregation Point, RCC Drain and Development of water body at JP Park (Muthyalanagara) in Ward No.17, BBMP, Bangalore.
Sample ID	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	09.10.2017

5200 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	435	8.37	8.37	91.63	90-100	
13.2	1762	33.88	42.25	57.75	56-88	
4.75	1658	31.88	74.13	25.87	16-36	
2.36	860	16.54	90.67	9.33	4-19	
0.3	162	3.12	93.79	6.21	2-10	
0.075	94	1.81	95.60	4.40	0-8	

Total Weight of Sample: 5000 gm

SIEVE SIZE,	Weight Retained,	% Retained	Cummulative % Retained	% Passing	Grade-II As per	Remarks

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Lab No.: CQCE/BBMP/KDC/W.No.17/2017-18 09.10.2017

Aggregate Impact Value

IS: 2386 Part IV

Client	**Executive Engineer,** Rajarajeshwari Nagar Division, BBMP, Bangalore.
Agency	**Sri. K.Damodar & Co,** Contractor, Bangalore.
Name of the Work	Remodeling of Segregation Point, RCC Drain and Development of water body at JP Park (Muthyalanagara) in Ward No.17, BBMP, Bangalore.
Source / Location	Hotmix Plant, Bangalore
Type of Mix	Bituminous Macadam
Date of Testing	09.10.2017

Sl No.	Details	Trial No. 1	Trial No. 2	Trial No. 3	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	377	379	381	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	86	88	90	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	291	291	291	
4	Aggregate Impact value = percent fines	22.81	23.22	23.62	
	100* (W_2/W_1)%				23.22

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

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Job No: CQCE/BBMP/KDC/W.No.17/2017-18 09.10.2017

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Executive Engineer,** Rajarajeshwari Nagar Division, BBMP, Bangalore.
Agency	**Sri. K.Damodar & Co,** Contractor, Bangalore.
Name of Work	Remodeling of Segregation Point, RCC Drain and Development of water body at JP Park (Muthyalanagara) in Ward No.17, BBMP, Bangalore.
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Bituminous Macadam
Date of Testing	09.10.2017

Flakiness Index = **12.52%**

Elongation Index = **14.15%**

Result: Combined Flakiness & Elongation index **26.67%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Macadam is 30%

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Job No.: CQCE/BBMP/KDC/W.No.17/2017-18 09.10.2017

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Executive Engineer,** Rajarajeshwari Nagar Division, BBMP, Bangalore.
Agency	**Sri. K.Damodar & Co,** Contractor, Bangalore.
Name of the Work	Remodeling of Segregation Point, RCC Drain and Development of water body at JP Park (Muthyalanagara) in Ward No.17, BBMP, Bangalore.
Source / Location	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	09.10.2017

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2022	2024	2026	
2	Weight of basket suspended in water	W_2 g	752	752	752	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1270	1272	1274	
4	Weight of saturated surface dry aggregate in air	W_3 g	2015	2017	2019	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	745	745	745	
6	Weight of oven dried aggregate	W_4 g	2007	2009	2010	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.694	2.697	2.698	2.696
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.723	2.726	2.731	2.727
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.40%	0.40%	0.45%	0.42%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Macadam is 2.0%

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Job No.: CQCE/BBMP/KDC/W.No.17/2017-18 10.10.2017

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS MACADAM MIX
AASHTO T 164 & AASHTO T 30

CLIENT	Executive Engineer, Rajarajeshwari Nagar Division, BBMP, Bangalore.
AGENCY	Sri. K.Damodar & Co, Contractor, Bangalore.
NAME OF THE WORK	Remodeling of Segregation Point, RCC Drain and Development of water body at JP Park (Muthyalanagara) in Ward No.17, BBMP, Bangalore.
DATE OF TESTING	10.10.2017

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	483.5	482.5
3. Weight of Asphalt and Mineral matter Extracted,	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	16.5	17.50
7. Bitumen content in %	3.30	3.50
8. Average	3.40	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
26.5	0	0	0	100	100
19	36.5	7.55	7.55	92.45	90-100
13.2	168.9	34.93	42.48	57.52	56-88
4.75	146.5	30.30	72.78	27.22	16-36
2.36	66.9	13.84	86.62	13.38	4-19
0.3	25.8	5.34	91.95	8.05	2-10
0.075	14.9	3.08	95.04	4.96	0-8

SIEVE SIZE	Trail 2				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
26.5	0	0	0	100	100
19	29.4	5.88	5.88	94.12	90-100
13.2	134.2	26.84	32.72	67.28	56-88
4.75	178.9	35.78	68.50	31.50	16-36
2.36	84.3	16.86	85.36	14.64	4-19
0.3	32.6	6.52	91.88	8.12	2-10
0.075	12.4	2.48	94.36	5.64	0-8

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Job No.: CQCE/BBMP/KDC/W.No.17/2017-18

Date: 12.10.2017

TEST REPORT

Client	:	**Executive Engineer,** Rajarajeshwari Nagar Division, BBMP, Bangalore.
Agency	:	**Sri. K.Damodar & Co,** Contractor, Bangalore.
Name of the work	:	Remodeling of Segregation Point, RCC Drain and Development of water body at JP Park (Muthyalanagara) in Ward No.17, BBMP, Bangalore.
Source of location	:	Hot mix Plant, Bangalore
Date of testing	:	12.10.2017

The results of the tests conducted on the bitumen sample using for Semi Dense Bituminous Concrete.

Sl. No	Description	Test Result	Requirement as per IS73-2006
1	Penetration at 25 ^{0}C, 1/10 mm	65	60 to 70
2	Softening point, ^{0}C	49	Min. 45
3	Ductility at 27^{0}C, cm	100 >	Min. 50
4	Flash Point, ^{0}C	282	Min. 220

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